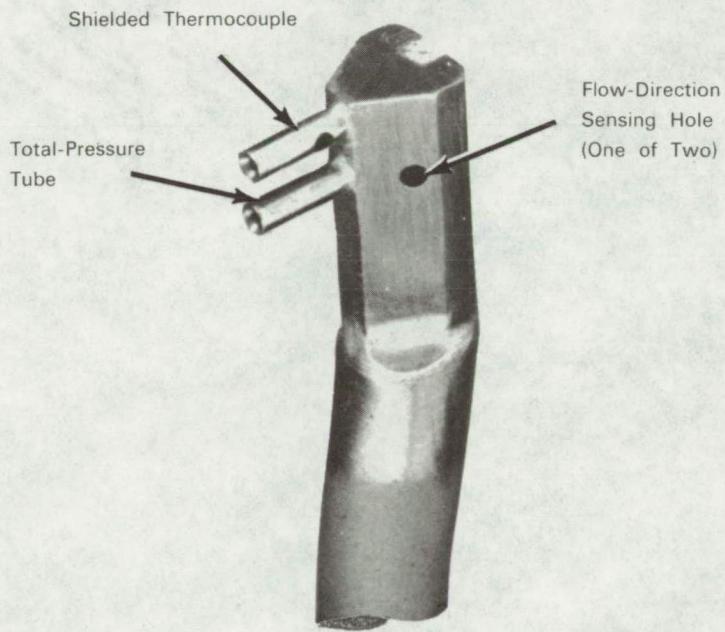


# NASA TECH BRIEF



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## Combination Probe for Airflow Measurements



### The problem:

One of the problems in experimental fluid mechanics is to provide small sensors to measure various parameters in the flow field. The use of individual immersion sensors, to measure a particular point in the stream, necessitates holding or repeating the flow condition for as many kinds of individual sensors as is necessary. Attempts to circumvent this by combining several types of sensors on one support usually result in too large an overall size and the compromising of performance of the individual sensors.

### The solution:

A small combination probe has been designed and tested whose primary intended application is on com-

pressor and turbine research. The probe combines a high-recovery shielded thermocouple for sensing total temperature, a total pressure sensing tube, and a flow direction sensing wedge having a 60° included angle. Also, in addition to these measurements, limited application may be made in using a flow direction sensing hole indication to obtain stream static pressure.

### How it's done:

By unique design and arrangement, the sensors have combined in one head to sample the flow in a small area without degrading the performance of the single elements. In this manner, the parameters can be measured simultaneously and in close proximity in the flow field. The probe head can pass through a 0.6 cm hole.

(continued overleaf)

**Notes:**

1. Although the probe was developed primarily for use in rotating machinery research, it is applicable wherever restrictions on size and requirements for multiple measurements exist.
2. Documentation for the invention is available from:  
Clearinghouse for Federal Scientific  
and Technical Information  
Springfield, Virginia 22151  
Price \$3.00  
Reference: B68-10558

Technical questions may also be directed to:

Technology Utilization Officer  
Lewis Research Center  
21000 Brookpark Road  
Cleveland, Ohio 44135  
Reference: B68-10558

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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